UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,041	07/24/2001	Lingyi A. Zheng	MTI-31470	4539

31870 7590 12/11/2003

WHYTE HIRSCHBOECK DUDEK S.C.
555 EAST WELLS STREET
SUITE 1900
MILWAUKEE, WI 53202

EXAMINER	
KENNEDY, JENNIFER M	
ART UNIT	**PAPER NUMBER**
2812	

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/912,041	ZHENG, LINGYI A.	
	Examiner	Art Unit	
	Jennifer M. Kennedy	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-91 and 125-136* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3,9,11*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Continuation of Disposition of Claims: Claims withdrawn from consideration are 6-8,18,19,24-29,32-35,44-46,53,54,59,66-71,77,79,84,86,89,127,129 and 133.

Continuation of Disposition of Claims: Claims rejected are 1-5,9-17,20-23,30,31,36-43,47-52,55-58,60-65,72-76,78,80-83,85,87,88,90,125,126,128,130-132 and 134-136.

DETAILED ACTION

Election/Restrictions

Currently claims 1-91 and 125-136 are pending. Claims 1-5, 9-17, 20-23, 30-31, 36-43, 47-52, 55-58, 60-65, 72-76, 78, 80-83, 85, 87-88, 90, 125-126, 128, 130-132, 134-136 are under consideration.

Claims 6-8, 18-19, 24-29, 32-35, 44-46, 53-54, 59, 66-71, 77, 79, 84, 86, 89, 127, 129, and 133 are withdrawn from further consideration pursuant to 37 CFR 1.142(b).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 9-10, 1-17, 20-23, 30-31, 36-39, 41-42, 47-52, 60-62, 64, 72-74, 76, 78, 80, 125-126, 128, 130, 132, and 134 rejected under 35 U.S.C. 102(e) as being anticipated by DeBoer (U.S. Patent No. 6,326,277).

DeBoer discloses the method of forming a uniform nitride dielectric layer over a nitride resistive material (14) and a nitride receptive material (34), the method comprising the steps of:

implanting a surface-modifying agent into exposed surfaces of the nitride resistive material (see Figure 6, column 7, lines 44-50);

forming the nitride dielectric layer (50, see column 9 lines 42-50) on the nitride resistive material and the nitride receptive material, whereby the surface-modifying agent provides for formation of the uniform thickness of the nitride dielectric layer over the nitride resistive material and the nitride receptive material.

Further, DeBoer discloses the method wherein the surface-modifying agent comprises an ionizable nitrogen or silicon material, a nitrogen-containing gas (see column 7, lines 44-52), implanting at a low angle implantation of about 60-85 degrees from vertical (see column 8, lines 40-52), the implantation implants the nitride resistive material layer within the container opening and at the corners of the container opening (see Figure 6).

Further DeBoer discloses the method wherein the nitride resistive material comprises an insulative material including borophosphosilicate glass (see column 5, liens 55-57), wherein the nitride receptive material (34) comprises a semiconductive material comprising hemispherical grain silicon.

Finally, DeBoer also discloses the method wherein a upper electrode is formed (50) over the nitride layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11, 40, and 65 rejected under 35 U.S.C. 103(a) as being unpatentable over DeBoer (U.S. Patent No. 6,326,277).

DeBoer discloses the method as claimed and rejected above, but does not disclose the implantation dosage. The selection of the implantation dosage is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious).

Claims 5 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBoer (U.S. Patent No. 6,326,277) in view Gardner et al. (U.S. Patent No. 5,783,469).

DeBoer et al. discloses the method as claimed and rejected above, but does not disclose the method wherein the nitrogen containing gas is trifluoronitride. Gardner et al. disclose the method of utilizing either nitrogen or trifluoronitride as a implant species (see column 5, lines 64-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize trifluoronitride as the implant gas rather than nitrogen because as Gardner et al. teach the gases are art recognized equivalents.

Claims 55-58, 63, 75, 81-83, 85, 87-88, 90, 131, and 135-136 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBoer (U.S. Patent No. 6,326,277) in view Hosaka (U.S. Patent No. 5,118,636).

DeBoer et al. discloses the method as claimed and rejected above, but does not disclose the method wherein the substrate is rotated during implant. Hosaka discloses the method of rotating a substrate during implantation (see column 1, lines 35-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rotate the substrate during implantation in order to prevent the shadowing effect.

Further, in response to Claim 57, DeBoer in view of Hosaka disclose the method as claimed and rejected above, but does not disclose the implantation dosage. The selection of the implantation dosage is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious).

Response to Arguments

Applicant's arguments filed in the Response sent May 13, 2003, entered as Paper No. 12 have been fully considered but they are not persuasive. Applicant argues that DeBoer is directed to solving a different problem than Applicant. The examiner agrees that DeBoer is directed to solving a different problem, but in doing so it discloses the limitations of the application at hand. It is not necessary for the reference to disclose that the process of the reference is performed to achieve the same goals as

applicant or to obtain the same advantages recognized by applicant. It is sufficient that the process suggested by the reference alone or in combination with the remaining references encompasses the instant claims.

It is clear to the examiner that the nitride resistive material (14, of BPSG) is implanted absent a mask. The examiner notes that the disclosure does not mention a mask being utilized during the implantation step of DeBoer.

Further Applicant argues the combination of DeBoer and Hosaka stating that DeBoer is concerned with allowing for a shadowing effect while Hosaka was concerned with avoiding the shadowing effect. The applicant defines shadowing effect as a portion of the trench not being implanted with ions. The examiner disagrees. The examiner notes that DeBoer is concerned with having all of the top portions of the edge of the cavity to be implanted so that the HSG would not form on all of the top portions of HSG. In other words, DeBoer also would like to avoid the shadowing effect caused by the angle of the implant, and thus, rotation of the substrate would be desired.

Applicant also argues that Hosaka teaches away form rotating the substrate. Teaching another way is a broad concept. It refers to a situation where a reference teaches a preferred, a better, or an alternative way to a claimed way of accomplishing something. A reference must be considered for all it teaches. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F .2d 281, 296, 227 USPQ 657, 666 (Fed. Cir. 1985). Preferred embodiments and disclosed examples do not constitute a teaching away form a broader disclosure or nonpreferred embodiments. *Merck & Co. v. Biocraft Labs.*, 874 F2d 804, 807, 10 USPQ2d 1843, 1846 (Fed. Cir. 1989); *In re Mills*,

470 F .2d 649, 650, 176 USPQ 196, 198 (CCPA 1972). Similarly, a statement that a first product is somewhat inferior to another product for the same use does not teach away when the reference also discloses that the first offers acceptable advantages. *In re Gurley*, 27 F. 3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994). In this case Hosaka teaches that the rotation allows for prevention of the shadowing effect.

The examiner notes the Applicants assertion that Claim 125 is a generic or linking claim.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Kennedy whose telephone number is (703)

308-6171. **After February 3, 2003, the examiner can be reached at (571) 272-1672.** The examiner can normally be reached on Mon.-Fri. 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. **After February 3, 2003 the examiner's supervisor can be reached at (571) 272-1679.** The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

jmk

John F. Niebling
Supervisory Patent Examiner
Technology Center 2800